

Mr. Robert F. Williams  
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San Jose, CA 95139-1152

STATE OF CALIFORNIA

State Energy Resources  
Conservation and Development Commission

In the Matter of:	)	Docket No. 99- AFC-3
Application for Certification for the	)	
Metcalf Energy Center [Calpine	)	Submittal and Motions by Robert F. Williams
Corporation and Bechtel Enterprises, Inc.]	)	
_____	)	

**Executive Summary of Comments on PSA and attached declaration.**

I hereby make the attached Table 1 pages 5-9 the center piece of both my PSA comments and my input to the schedule conference. The Table 1 is a score card giving a summary of the PSA. The revised PSA should contain an analysis similar to Table 1, and a conclusion supported by the Table. It together with the declaration and submittals by other parties, is the basis for the six motions on page 2 and 3 below:

Summary

1. Because of the severe unmitigable adverse impacts, SUAIs, tabulated in Column 2, of Table 1, pages 5 to 9, the CEC should reject the application now.

These defects cannot be mitigated at the present site and will persist independent of design change. There is no identified significant benefit to justify changing LORS or accepting these impacts.

2. If CEC feels it must proceed, then a second PSA is required because there are many significant changes, that almost amount to a new application. Column 3 are as yet unmitigated significant impacts that have not been engineered, just very preliminary designs and promises. The applicant joins the motion of CVRP for a second PSA in the event item 1 is denied.

3. Conditions of Compliance. Because of the applicants lack of final engineering on many of the promised mitigations, CoCs that have real teeth, i.e. that require derating or shutdown while the failure to comply post construction are mitigated, are appropriate and necessary.

Under regulations of the CPUC fines came out of profits and dividends to stockholder. ROI was reduced by the CPUC. Under deregulation the public pays the fines through its electric rates. The only way to penalize the merchant vendor effectively is a shutdown, with agreed upon triggering conditions, similar to a liquidated damages clause in a contract. Daily profits are so much bigger than credible fines that little suasion is offered by the present enforcement structure. See Appendix

1. Derate rather than shutdown may be appropriate for some lesser infractions, provided the plant air cleanup systems work as well at lower power levels.

4. Joint BACT hearings. CEC with BAAQMD should hold a joint hearing once or twice per year to determine BACT. Why joint? If CEC hold the hearing alone, it forces the BAAQMD into the arms of the merchant power vendors to defend the local (potentially obsolete) BACT determination. CEC has statewide scope assuring relevant data is considered from other Air quality districts. Better not to foster an unholy alliance of vendors and local regulators with CEC alone conducting the hearings.

As outlined in Appendix 4 hearings also should be held regarding carbon dioxide, the largest effluent from the plant, and potential methane leakage, because of significance of both to global warming. See appendix 4.

5. Contention regarding the PSA. The Table of major points is in effect a score card. Some at CEC might contend there is overlap or double booking in the Table, for example isn't NOx just an Air quality issue. I contend No, the CEC staff, because of work load, has a difficult time with issue integration between different PSA Chapters.

If NOx is wrong it can influence the butterfly issue. If air quality modeling of plume deposition of water is not correctly modeled, excess water may be omitted, incorrectly, in the butterfly analysis. There are dozens of examples. It is important to highlight the feedback and interaction between various issue areas, and I have done this, I believe fairly, in the Table or Score Card. Transportation accidents offsite near the plant may influence ground water modeling, etc. Should accidental releases be under public health and safety, transportation accidents, or worker health and safety? At present portions are covered in three different sections.

6. Design changes. The severe unmitigable adverse impacts (SUAI) are a reason to reject the PSA now. Some Severe Impacts, not yet mitigated, column 3, page 5 ff., arguably might be mitigated with several inter-related major design changes. The interaction between plant design and environmental issues, coupled with the need for major design changes discussed in the next section, is a basis to direct a second PSA incorporating the major changes as a whole.. Estimated time 3\_ to \_ months from now as minimum, depending on how fast BACT, change to SCONOX, pre-construction at site Monitoring, plume effects, ground water pump down tests to confirm modeling, dry cooling, drought year allocations, and many inter-related issues can be resolved.

Robert F. Williams hereby moves the Energy Commission order

1. Rejection of the AFC because there are numerous severe unmitigable adverse impacts that will remain adverse and unmitigable, and there is no benefit or public necessity and convenience to justify accepting the adverse impacts on this project.
2. If 1 is not granted, order an expeditious hearing of BACT and at site air monitoring
3. Order preparation of a second PSA as petitioned by CVRP, because of the complexity in the number of elements of the plant that require a design change to mitigate Severe Impacts

4. Open a hearing with CARB on carbon dioxide and methane, for the reasons stated in App. 4
5. Order a second PSA to permit specificity in Conditions of Compliance that may require shutdown under mutually agreed technical triggers. The number of design options is at present too great to develop a fair and meaningful list.
6. Plan a second schedule conference after BACT and monitoring hearing, to determine the date for the second Preliminary determination of Air Quality, the applicants technical intention on dry cooling and SCONOX and numerous inter related matters, and a date for the second PSA

The motion is made on the grounds that:

Please see above and the attached declaration.

The motion is based on the pleadings and records on file in this proceeding and the following:

<input checked="" type="checkbox"/>	The attached declaration of June 30, 2000
<input checked="" type="checkbox"/>	The Submittal of CARE CURE, and CVRP challenging BACT
<input checked="" type="checkbox"/>	Oral and documentary evidence that may be presented at hearing

June 30, 2000

*original signed by RFW*

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Date

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Signature

Declaration of Robert F. Williams re PSA  
Robert F. Williams June 30, 2000

I. Introduction and Summary

Note: Please refer to Table 1, page 5 to 9, and Appendix 6-Chapter by Chapter comments.

A. Six significant unmitigable adverse conditions, and 5 major uncertainties that may require a year or more to resolve together and separately justify rejecting the application now.

- Conditions (SUAI) that won't change are as follows:

1) Zoning / Land Use. Existing zoning is Campus / Industrial (more accurately Campus Office Park) The power plant is not compatible with existing residential and school locations, and with planned future development as a world class center of technology. A power plant cannot be made to be an office building.

2) Cooling tower and combustion gas stacks visual impacts are unacceptable in the present location, particularly stacks with visible plumes, and cooling towers with visible plumes and water drift. Power plant is not and cannot be disguised as an office building.

3) Noise. Noise from the power plant, and the potential amphitheater effect of Tulare Hill mean riparian corridor criteria not met, and nuisance to local residents and historic sites may be very difficult or impossible to abate because of anomalous sound reflection, similar to that observed at Shoreline Amphitheater in Mt. View noise impacts in Palo Alto.

4) Ammonia and toxic material transport presents hazards that are not required and should not be accepted in view of off site transport accident risks. Off site transport accidents with ammonia and other toxics are un-needed and unjustified risks in this area.

5) Socio economics. Rezoning of land from Industrial to Campus Office Park has resulted in approximate doubling of price for the property in North San Jose. This is an objective measure that Industrial zoning suitable for power plants degrades real estate values compared to Campus / Office Park. (Note campus /industrial is referred to as campus /office park to more clearly convey the zoning category.

- Significant major uncertainties likely will remain unresolved for several month; some have potential outcomes that are SUAI not a SInym

1) Cooling water availability. The EIR for the water pipeline has not been drafted, nor public hearings held. Right of way issues are not resolved. The availability of Potable water from ground water during drought years has not been evaluated or resolved. Water balance relied on 17,000 Acre Feet per year of imports. Availability during drought unsure.

2) Drought year allocations. The allocation of reclaimed water in drought years, the fair share of potable groundwater for power plant use, and the effect of any over draft on the confined San Jose aquifer as the Coyote valley aquifer is depleted is unresolved.

3) At least a year delay is required for ambient air and meteorological measurements under Section \_\_\_\_ of the Clean Air Act. BAAQMD requirements for such monitoring are likely to be triggered by the top down BACT review, or by direct reading of the Clean Air Act.

4) The potential applicability of the EPA Well Head Protection Act applied in Niles Canyon, Highway 84 between Pleasanton and Newark, is a new as yet unevaluated issue that may restrict the shipment of toxic materials near the transition from the unconfined Coyote aquifer to the confined San Jose aquifer used for the South San Jose water supply.

5) Biologic impacts uncertain until better air quality modeling that includes potential water deposition and refinement of NO<sub>x</sub> values is done.

Table 1-Summary of Comments- A Score card.  
(Sequence to match Alternatives Table, pp 485-487)

Factor	Significant . Unmitigable Adverse Impact. (SUAI)	Severe Impact not yet mitigated. (SInym)	Deny or SPSA	New Condition of Compliance with teeth to address SInym
Overall Finding	<ul style="list-style-type: none"> <li>● Reject the application now.</li> <li>● See all entries in this column below</li> </ul>	<ul style="list-style-type: none"> <li>● Second PSA-Delays by applicant as a minimum require a second PSA.</li> <li>● See all entries below.</li> </ul>	X Y Z	<ul style="list-style-type: none"> <li>● Conditions of Certification lack clout. Fines a small fraction of one day revenue. Shutdown under certain agreed conditions mandatory.</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>● Top down BACT-required. PM10 and secondary PM10 disqualify</li> <li>● NOx, VOC, POC, better with SCONOX, but not yet proposed</li> <li>● ERC s are a tax, not mitigation.</li> <li>● Cumulative air impacts mitigated by alternate site, not addressed.</li> <li>● Change to dry cooling. See water</li> <li>● Carbon Dioxide/CH4- See App 4</li> </ul>	<ul style="list-style-type: none"> <li>● 1 year at site monitoring.</li> <li>● SCR is not BACT. Change to SCONOX</li> <li>● Monitoring will reveal potential plume deposition w Biologic, land use, visual, water quality impacts-</li> </ul>	X Y Z	<ul style="list-style-type: none"> <li>● CEC rarely shuts plants down and fines are miniscule.</li> <li>● REQUIRE BACT a new independent monitor and shutdown based on CEM, and shutdown based CoC.</li> </ul>
Biologic resources	<ul style="list-style-type: none"> <li>● Improvements to Fisher Creek a plus, but a repair that would be required of any developer.</li> <li>● Spotted butterfly impacts not acceptable as currently proposed.</li> </ul>	<ul style="list-style-type: none"> <li>● Potential SInym on spotted butterfly-</li> <li>● Water effects plus NOx. Need met tower-1 yr test</li> <li>● Noise impact on biota-nym</li> </ul>	Y Z	<ul style="list-style-type: none"> <li>● Applicant has failed to address need for ridge line mitigation of NOx.</li> <li>● A CoC for potential plume deposition resulting in shutdown.</li> </ul>

- X= Column two considerations justify rejection. The Significant Unmitigable Adverse Impact (SUAI) cannot be mitigated at this site, and are not offset by a finding of public necessity, i.e., public need and convenience. There are no major benefits at the Tulare Hill site.
- Y= The Column 3 incompleteness of the PSA justifies a second PSA to meet the Commissions order. Significant time is required to address the SInym, 3 to 12 months. Major changes are highly likely and in some cases mandatory , and should be reviewed before an FSA. The applicant should be penalized, not rewarded for dilatory tactics.
- Z= Because of lack of engineering the promised mitigation are in many cases speculative. To force a better job, shutdown under certain conditions in the conditions of compliance should be mandatory. A second PSA would be helpful in resolving the criteria and measurements justifying fines and/or shutdown. The applicant should do a first rate job since his revenues will be between \$ 0.5 to \$ 1.5 Million per day.

Under deregulation the public pays the fines. The stockholders and merchant power vendors are rewarded by dilatory tactics. Shutdown under agreed conditions is the only practical penalty.

Table 1 continued

Factor	Significant . Unmitigable Adverse Impact. (SUAI)	Severe Impact not yet mitigated. (SInym)	Deny or 2nd PSA	New Condition of Compliance with teeth to address SInym
Cultural Resources	<ul style="list-style-type: none"> <li>• There is a high risk that the site contains both burials and artifacts.</li> <li>• Exploration was not sufficient</li> </ul>	<ul style="list-style-type: none"> <li>• Areas around springs not investigated sufficiently.</li> </ul>	X Z	<ul style="list-style-type: none"> <li>• Require new site screening with appropriate experts present before second PSA and FSA .</li> </ul>
Geologic and Paleontological Resources	<ul style="list-style-type: none"> <li>• Site has potential for liquefaction during earthquake, not yet addressed.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential significant impact from flooding, but mitigable</li> <li>• Very deep piles - nym.</li> </ul>	Y	<ul style="list-style-type: none"> <li>• Flood channel blockage-nym</li> <li>• Noise from pile driver-nym</li> <li>• Interaction with Cultural nym</li> </ul>
Zoning -Land use -Agricultural land - planned development permit	<ul style="list-style-type: none"> <li>• Power Plant use not compatible with existing residential and school uses or planned future growth as Campus /Office Park-note 1</li> <li>• Existing Zoning, Campus /Office Park, and residential incompatible with M-4 heavy industrial.</li> <li>• Planned development rezoning not acceptable for power plant</li> <li>• Some agricultural land is taken from the edge of the previous North Coyote Valley.</li> </ul>	<ul style="list-style-type: none"> <li>• This topic a basis for rejection or major delay.</li> <li>• Lack of planned development (PD) permit prevent key details like trails and riparian corridor from resolution.</li> <li>• PD Can t be issued unless favorable action is taken by city to rezone.</li> </ul> <p>Consequence: Delay</p>	XXX	<ul style="list-style-type: none"> <li>• This topic a basis for rejection now</li> <li>• Notes: Socio-Economic Impact does not adequately cover the economic impact. Rezoning from Industrial to Campus/ Office Park approximately doubled the value of one parcel in north San Jose, for \$ 11 to \$ 22 Million.</li> <li>• Many plant details are not completely defined because they would be part of a planned development permit.</li> </ul>
Noise - Neighbors - Riparian	<ul style="list-style-type: none"> <li>• Amphitheater effect-Has not been considered and will likely disqualify due to noise amplification to Historic Hayes Mansion, and over Tulare Hill under difficult to predict Meteorological conditions.</li> </ul> <p>(Shoreline Amphitheater precedent)</p>	<ul style="list-style-type: none"> <li>• Riparian Corridor requires zero noise increase.</li> <li>• Boiler feed pump, Gas Turbines major generators</li> <li>• Zero Not achievable for power plant but achievable for office buildings.</li> </ul>	X  (Y Z)	<ul style="list-style-type: none"> <li>• If the plant were to proceed based imperfect noise barriers, CoC for shutdown to retrofit better sound proofing is a way to avoid promises that can t and won t be kept without teeth.</li> </ul> <p>New CoC mandatory</p>

Note 1: I have used Campus/office park rather than Campus/Industrial as indicative of the true nature of the zoning. In San Jose Power plants are zoned Industrial M-4



Table 1 —continued

Factor	Significant . Unmitigable Adverse Impact. (SUAI)	Severe Impact not yet mitigated. (Sinym)	Deny or 2ndPS A	New Condition of Compliance with teeth to address Sinym
Public Health - Health effects of criteria pollutants - Acrolein - Ammonia - Accidents	<ul style="list-style-type: none"> <li>● The consequence of an ammonia truck and train collision at the unprotected grade crossing may be 1000 blinded, and with lung damage, Deaths ??</li> <li>● Are many potential injuries justified when a grade separation can be built or a less urban site selected?</li> <li>● With SCR ammonia risk is unmitigated and disqualifying at an urban site. (See Fox testimony on Elk Hills 5/15</li> </ul>	<ul style="list-style-type: none"> <li>● The health effects, both trace organics and criteria pollutants should be tabulated.</li> <li>● Offsite ammonia accidents credible and require mitigation.</li> <li>● Acrolein effects not considered</li> <li>● Formation of PCB s and Dioxin in superchlorinated recycle water not yet considered.</li> </ul>	X Y Z	<ul style="list-style-type: none"> <li>● Health effects of criteria pollutants emitted at federal or state limits are significant. PSA potentially misleading to public.</li> <li>● Ammonia impacts mitigated with SCONOX</li> <li>● Acrolein , PCB, Dioxin still open and require PSA level discussion.</li> <li>● Cooling tower drift into Coyote Valley Aquifer nym</li> </ul>
Socio Economics -Impact home price - Impact on future campus /office park	<p>Disqualifying since site is zoned for a higher use. Rezoning industrial land in San Jose to Campus/Office park doubles land value.</p>	<ul style="list-style-type: none"> <li>● Homeowners and office workers will be impacted through health effects, noise and lower home price</li> <li>● Emergency service must be ready-HazMat response</li> </ul>	X Y Z	<ul style="list-style-type: none"> <li>● CoC A plant as clean and quiet as an office building in a research park has not been proposed.</li> </ul>
Soil and Water Resources  - City of San Jose No visible plume(s)	<ul style="list-style-type: none"> <li>● EPA Well Head protection Act. Only recently raised &amp; unresolved</li> <li>● Multi yr. Drought water resource ..potentially <i>suai</i></li> <li>● Cooling tower plume visibility-<i>suai</i></li> <li>● Cooling tower deposition on Hill</li> </ul>	<ul style="list-style-type: none"> <li>● Salt in SCVWD return still not designed or resolved.</li> <li>● Consumption of water by power plant in city during 5 year drought will require mandatory derate for</li> </ul>	X Y Z	<ul style="list-style-type: none"> <li>● Mitigation of cooling tower plumes by use of dry cooling is totally achievable.</li> <li>● Minimize water issues with dry cooling</li> <li>● Promises by vendors for only 40</li> </ul>

<p>WATER-con t</p> <p>Contamination</p> <p>Cooling tower drift</p> <p>Truck chemical spill</p> <p>Pipeline EIR</p>	<p>and into unconfined aquifer. <i>Suai</i></p> <ul style="list-style-type: none"> <li>● Combustion gas plume visibility</li> <li>● Soil on Tulare Hill, and ground water contamination from PCB Acrolein, dioxin into open aquifer potential <i>suai</i></li> <li>● Fast transport of toxics to San Jose confined aquifer potential disqualified.</li> <li>● No EIR has been submitted for recycle pipeline. Supplier relationships unclear-<i>suai</i> probable until 2004</li> <li>● Well pumping tests to validate models not yet done.</li> </ul>	<p>equitable sharing of water</p> <ul style="list-style-type: none"> <li>● Chemicals for cooling tower water cleaning not yet considered</li> <li>● Redesign for new plant footprint with dry cooling.</li> <li>● MEC Needs for fresh groundwater now 1500 AF escalated from 30 days to 45 days. What next?-<i>nym</i></li> <li>● Subsidence unresolved.</li> <li>● Drought year share-<i>nym</i></li> </ul>	<p>X</p> <p>Y</p> <p>Z</p>	<p>hours per year plume visibility not credible and motivates CoC require shutdown after exceedence.</p> <ul style="list-style-type: none"> <li>● Drought year allocations still unresolved. Prorated MEC derate</li> <li>● Vendor promises cooling tower drift &lt; .0005 under all wind conditions not credible. Need met tower data and CoC for shutdown.</li> </ul> <p>No EIR plus high drought year potential 2002 to 2005 motivate recycle water pipe as a condition of startup. Pipe could be delayed.</p>
Factor	Significant . Unmitigable Adverse Impact. (SUAI)	Severe Impact not yet mitigated. (Sinym)	Deny / SPSA	New Condition of Compliance with teeth to address Sinym
<p>TRAFFIC and Transportation</p> <p>- Offsite accidents</p>	<ul style="list-style-type: none"> <li>● Offsite toxic material releases, shipping accidents in area subject to EPA Wellhead protection act-more study-may disqualify</li> </ul>	<ul style="list-style-type: none"> <li>● Hazard at rail crossing-<i>nym</i></li> <li>● Train derailment credible Require fence for worker safety, avoid gas line break.</li> <li>● Offsite accidents with toxic materials-<i>ny eval /nym</i></li> <li>● Unsure if trucks hauling fill dirt were considered —<i>nym</i></li> </ul>		<ul style="list-style-type: none"> <li>● CoC to require highest HazMat category for ammonia trucks.</li> <li>● Escorted shipments from 101</li> <li>● Completion of Bailey crossing separation before operation.</li> <li>● Recent (5 yr ago) train derailment near IBM</li> <li>● Pepsi Truck train crash-ditto</li> </ul>
VISUAL RESOURCES	<ul style="list-style-type: none"> <li>● Architectural fa ade does not hide plant and may increase noise</li> <li>● Plumes, plant exhaust gas, and cooling tower-Not compatible with Campus office park zoning.</li> </ul>	<ul style="list-style-type: none"> <li>● See CARE on proper modeling of air down wash.</li> <li>● Stacks may be too short Zoning precludes taller.</li> </ul>		<ul style="list-style-type: none"> <li>● Stacks may be too short when on site meteorology is complete and office park bldgs. Of 120 ft height considered.</li> </ul> <p>(Ht still exceeds zoning limits)</p>

Waste Management	<ul style="list-style-type: none"> <li>Criteria pollutants not BACT levels</li> <li>Acrolein and PCB, Dioxin still open</li> </ul>	<ul style="list-style-type: none"> <li>Replacement of SCR catalyst every 3 years-nym.</li> <li>Salt in recycle water-nym</li> </ul>	Y Z	Should not proceed until BACT review, and meteorological tower measurements are in hand.
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Table 1-continued

Factor	Significant . Unmitigable Adverse Impact. (SUAI)	Severe Impact not yet mitigated. (SInym)	Deny / SPSA	New Condition of Compliance with teeth to address SInym
Transmission systems effects (T)	<ul style="list-style-type: none"> <li>Should not be considered. It is externality like need for power</li> <li>If T is considered transmission system expansions are better than the plant. E.g. \$22 M transformer 500/230 kva at Metcalf Substation. solves south San Jose power problems.</li> <li>Moss landing only 30 miles away preferred for environmental reasons,</li> </ul>	<ul style="list-style-type: none"> <li>Difference of line length of less than a few miles not significant between Tulare Hill and 6 Alternatives.</li> </ul>		<ul style="list-style-type: none"> <li>Transmission voltage support not a benefit justifying accepting other sever unmitigable adverse impacts of this plant.</li> </ul>
Benefits	<ul style="list-style-type: none"> <li>None that justify accepting suai</li> <li>- Plants already sited meet power need</li> <li>- Water use a detriment not a benefit, when drought analysis is completed.</li> </ul>	<ul style="list-style-type: none"> <li>Use of recycle water is highly speculative when all factors evaluated.</li> </ul>		<ul style="list-style-type: none"> <li>Reject this plant now.</li> </ul>

Also note that cumulative impacts in air quality may disqualify the plant depending on whether SCR is retained, or rejected in favor of SCONOX or equivalent. State criteria for PM10 may be exceeded, and federal levels approached or exceeded depending on the Best Available Control Technology determination.

Conclusion. In view of the significant unmitigable adverse impacts, SUAI, and in view of very low likelihood of finding significant benefits to support a finding of public necessity and convenience in accepting these severe impacts, the effort to resolve the Column three issues is unwarranted. Unmitigable impacts will stay unmitigable.

REJECT THE APPLICATION NOW FOR CAUSE.

B. Six Major contentions justify a second PSA if somehow we must proceed.

There are six major contentions that arise from detailed review of the project. Each effect the overall direction of the project, and the Staff Analysis. Remedies are complex and inter-related. Appendix 2 explains the air issues in layman s terms. Appendix 3 adopts other intervenor testimony, and summarizes in more detail the required steps in BACT and Air Quality issue resolution..

1. BACT and Air issues. If the Commission feels it must proceed, the Severe Impacts, not yet mitigated, required a second PSA, not an FSA, because several inter-related changes require essentially a new design. A top down BACT a new Air quality analysis (Pdoc), and major new evidence in water quality analysis including potential shift to dry cooling, well pumping test, water allocation during drought, and the capacity of wells in the Coyote Valley to provide even 1500 AF/yr of potable water for power plant use during drought years. These issues and others need workshop level discussion before the formality of evidentiary hearings. See below beginning at page \_ff.

2. Conditions of Certification. The change to the approach to enforcement of conditions of certification requires a second preliminary staff analysis.

Even if there were no design changes, (and multiple changes are required) a new approach to enforcement of Conditions of Certification is required that mandates both shutdown, and or derating when agreed upon triggering technical conditions are reached. The applicant has suggested or promised improvements with little technical or evidentiary backup. He should be asked to back certain promises with required mandatory derate or shutdown, in view of the massive profits of the plant, \$400,000 to \$ 1.4 Million per day under foreseeable pricing conditions. (3 cent to 10 cents per kwhr). See Appendix 1.

4. .There are major issues in the Air Quality Analysis review that cascade into other environmental issues and must be resolved early before the AFC proceeds to an FSA. A joint hearing of the BAAQMD and the CEC on BACT is the starting point, and will help determine that indeed the air quality levels provided by SCONOX are BACT and such levels cannot be reached by SCR. The elimination of ammonia and ammonia related offsite accidents is a major consideration in Water Quality Analysis, in hazards to office workers and school children, in evaluating chemical spills under the Well Head Protection Act, and in determination of biological impacts.

5. The Federal EPA Guidance cited in CARE p66 to 69 (1) notes the requirement for 1 year of on site monitoring unless there is five years of qualified meteorological data at the site. The closest data, 5 km away, is at IBM under totally different topological conditions, and covers only 1 year, not the required five years.

The potential severity of the downwash into the adjacent Office Park, the potential for massive plume visibility on many days of the year, plume deposition on the Tulare Hill and environs under conditions that lead to fog or frost and many other high humidity conditions have not been sufficiently evaluated.

The applicant has side stepped the BAAQMD requirement for such monitoring by estimating NOx and PM10 release to be just below thresholds that would trigger such monitoring, but the proposed emissions levels are without sufficient backup, and ignore several exacerbating phenomena, notably secondary PM10.

- a) The inclusion of small amounts of secondary PM10 would trigger the BAAQMD requirement for at site pre -construction monitoring, exceeding the PSD threshold.
- b) Alternatively, the plain language reading of Federal EPA guidance as cited by CARE pp66-69 is sufficient to require the monitoring.
- c) Technical issues related to downwash from Tulare Hill. Downwash into the Office Park, insufficient stack height to protect the office park, and plume intersection and or deposition on the hill due to effects of wind or marine layers and temperature inversions with ambient air near saturation all require ambient air quality including dew point, and temperature /humidity data with height up to 100 feet above Tulare Hill. The on site measurements are needed before construction begins because adverse finding leave SI-nym that may not be possible to address by design once construction begins.

6) Dry cooling solves lots of problems. The burden on the applicant should he elect to change to dry cooling is not very onerous. The applicant has the Sutter plant with dry cooling towers under construction. Sutter is arguably more advanced in engineering detail than Metcalf energy center AFC.

- The immaturity of the Metcalf design, and thus the ability to change, is illustrated by two instances in the June 2000 workshops. The application under Regulations adopted by BAAQMD in May 2000, must secure wet cooling tower certifications. Hearings, and new workshops are required to determine among other things, whether the wet cooling tower regulations are adequate for a large stationary power plant in a high tech Office Park. But change to dry cooling is appropriate.

- a) The applicant in workshops contends no foundation drawings have yet been prepared, and
- b) applicant proposes with a press release on the Final Day of PDOC comments, to reduce, the emissions by 30% with undesignated equipment change. When asked 3 weeks later, a larger catalyst bed in the SCR was described. When pressed on detail, as to why sub elements in Air Quality analysis do not add up to the revised total (essentially  $1+1+1 = 2.1$  not 3), fancy footwork and a suggestion that continuous emission monitoring be the basis to invoke different operating strategies achieving the reduction is proposed..
- c) This has every appearance of stretching technology to the limit, and is the basis for requesting CoC that require shutdown, not years of hearings while the applicant struggles to milk the last drops of improvement out of an obsolete SCR gas emissions system than should have been changed to SCONOX.

7) A dual change to dry cooling and SCONOX could mitigate many, but not all of the Significant Impacts not yet mitigated (SI nym. It could resolve or minimize many inter related issues in Water Resources. Continued intransigence in the face of the cited regulations, appears sufficient to reject the application, based on the applicants intransigence.

Alternatively the public, the intervenors, and the staff face potential design changes at the very last minute, with no forum for review almost on the day of the Final Decision, or even worse a plant operating outside limits while the applicant pleads for more time to resolve problems, as in the case of Crockett.

C. A summary of potential issue areas, and sections of the PSA that require new conditions of compliance, with agreed triggers.

1. Background and justification.-Conditions of Compliance. Because of the applicants lack of final engineering on many of the promised mitigations, CoCs that have real teeth, i.e. that require derating or shutdown while the failure to comply is mitigated, are appropriate.

2. Under regulations of the CPUC fines came out of profits and dividends to stockholder. ROI was reduced by the CPUC. Under deregulation the public pays the fines through its electric rates. The only way to penalize the merchant vendor effectively is a shutdown, with agreed upon triggering conditions, similar to a liquidated damages clause in a contract. Daily profits are so much bigger than credible fines that little suasion is offered by the present enforcement structure. See Appendix

Derate rather than shutdown may be appropriate for some lesser infractions, provided the plant air cleanup systems work as well at lower power levels.

3. Particular areas where the applicant should not be allowed to operate, because his promises are viewed as speculative, and unsupported.

- exceedence of ammonia slip in excess of BACT for SCONOX, as determined by continuous emission monitoring.
- Excedence of POC, VOC, and NOx on one hour and three hour bases, in excess of BACT for SCONOX, as evidence by direct continuous emission monitoring, with frequent periodic re-calibration.
- Water deposition from whatever source, combustion gas condensation, or cooling tower condensation in excess of agreed amounts. Increased frost deposition as ice, and increased plume visibility due to inversion layers or wind and down wash effects shall be included.
- A set of measuring stations shall be established as mutually agreed, but including ridges, and including areas noted for morning frost deposition, or fog or ground fog incidence.
- The use of single parameter emission control factors, related to one item such as fuel consumption, shall be reviewed, and changed to include other appropriate factors. For example factors that may influence emissions at part load, and during start up or shutdown, will be specifically evaluated.

- An independent agency of approximately Five staff should be funded by the applicant as an additional tax element, to permit timely action. Enforcement by BAAQMD from San Francisco, or by CEC from Sacramento, has not been adequate in the opinion of many of the public and this intervenor.

Agreed upon forms of evidence including but not limited to strip charts, CEC raw data, video tapes of fog, recording tapes of noise, rain gage measurements, shall be agreed to as prima facie evidence requiring shutdown or derate as the case may be.

Generally, the plant will be in shutdown or derate while hearings are held on further mitigation, if the prima facie factor earlier mandated by the commission, have been measured by the agreed devices.

3. Certain milestones must be achieved prior to start of construction, areas where the applicant should not be allowed to start, because his promises are viewed as speculative, and may require significant redesign if adverse outcomes occur.

These include but are not limited to the following:

- At site air quality monitoring, and agreed analysis using the monitoring data.
- Analysis of local \_ mile, 1 mile and 5 mile water deposition under reasonably occurring meteorological and temperature inversion conditions.
- Preliminary drought year (1 and 5 year) water allocations.

4. Certain milestones must be achieved prior to start of operation. There are Particular areas where the applicant should not be allowed to begin to operate, because his promises are viewed as speculative, and or preliminary understandings may not have been consummated.

- Droughts have occurred in San Jose and northern California in 1977 and 78, and in 1987 and 88. A very dry 5 year period, in some respects the model for a 5 year drought in planning for the regional water supply occurred in 1988-1993.

- The interval and recurrence of drought is speculative, and might occur as early as 2001, or in any year following, 2002, 2003, ad 2004.

- Thus if the applicant pursues the wet cooling with recycle water strategy, he may not start the plant until the recycle water line is in place with all permits and approvals to operate.

- Resolution of 1 and 5 year drought ground water allocations between water supply agencies, including both potable drinking from groundwater or other potable water sources, and recycle water that must be shared and allocated between agencies. The viability of the 17,000 AF per year importation must be specifically confirmed.

- The extent and degree of various over draft conditions and the effect on ground subsidence and long term viability of the water supply.



- Resolution of issues, including any permits and hazardous material shipment limitations required under the EPA well head protection act. (For reference similar to Niles Canyon)

5. The prospect of increase in significant water deposition on Tulare Hill and on ridge lines in Coyote valley for whatever scientific or technical reason, and the significance to the habitat of the spotted butterfly must be evaluated. Excessive water deposition may require time of day or seasonal limitations on the operation of the plant, based on agreed upon measurement techniques appropriately benchmarked.

6. Recharge of San Jose confined aquifer by Coyote unconfined valley aquifer.

Preliminary presentations, still un-validated by well pump test, indicate as much as 5000 acre feet per year recharge to the San Jose Aquifer from the Coyote Valley aquifer. This amount in a total water balance of nominally 20,000 Acre Ft per year, a wet year not a drought year condition. The drought year Basin capability may be as low as 3000 to 4000 acre ft per year, depending on many things including the availability of water imports for recharge.

Key hydrological characteristics of the regional groundwater system require better definition before permitting, and significant confirmation before plant construction and operation.

Depending on the mode of cooling, and whether SCR with ammonia transport is finally selected or a change made to dry cooling and SCONOX, the many issues regarding water protection of the unconfined Coyote Valley aquifer, and the rapidity or emergency response to avoid San Jose aquifer contamination must be resolved.

There are too many permutations and combinations to define the water CoC criteria now.

#### IV. Gaps in Inter Agency Coordination.

For the benefit of future applications, and to improve the coordination between Air Quality Districts, California Air Resources Board, the California Independent System Operator, and the California PUC and its regulated electric and Gas distribution utility, the following comments and observations are made on areas where better coordination would be in the public interest in the opinion of this party.

#### CEC AQMD related issues

1. Require a top down BACT submittal with each AFC as a condition of data adequacy. This should be done in spite of local air quality district rules that adopt BACT rules, because such rules appear to have fallen behind technology. The CEC is in a better position to stay abreast of technology changes than local boards.

2. A hearing on BACT should be jointly conducted by the CEC and the local AQMD, to review and validate BACT. The PDOC analysis should not begin until the top down BACT, is reviewed and approved.
3. Agreed upon rules for cumulative air quality impacts taking into account reasonably foreseeable development (i.e like Cisco) over the next 5 and ten years should be established.
4. Analysis of wet cooling towers and cooling tower effluents should be a specific element of the BACT, the AFC and of the PDOC.

#### CEC-CARB

5. CARB and CEC should take immediate steps to address two major unregulated effluents carbon dioxide and methane which arguably have at least as much significance as protection of endangered species. Carbon dioxide, and methane emissions are potentially the largest significant effluents. If legislative authority is deemed necessary, fact finding hearings should be conducted in the public interest while legislation is considered.

#### Electrical Issues and Transmission System expansion- Cal Iso PG&E, CPUC, Oversight

1. Publicly available model for System, and Planned System expansion and anticipated load growth is needed. A set of a few data cases can be defined that permit the applicant, the CEC staff, and the public to conduct studies by themselves or with assistance by consultants.

The cost of a system expansion study has often been alleged to be \$100,000. CEC and Cal-Iso have particular judgements and approximations that often confuse the public, are not readily reviewed, particularly in the analysis of alternative power plants alleged to be needed for voltage support or other transmission considerations.

There should be an independent open data base, and an independent open system expansion model available from a mutually agreed source over the internet.

Advances in computers are such that it is difficult to see how \$100,00 could be required for a system study. Similarly it is difficult to see how almost man year of effort would be required except in assembling the original data base, and year by year or quarter by quarter forecast load and system changes.

2. Because transmission system expansion arguably has a much lower cost and a much shorter lead time using existing right of ways, generally speaking it appears transmission expansion should be approved shortly following AFC s so that transmission is not a contention in plant AFC s
3. To permit viable competition, some additional transmission line redundancy is required and necessary. Some appropriate ground rule to meet the intent of used and useful while permitting adequate grid redundancy should be developed in hearings, as soon as the public model is available, or sooner if the public model is delayed more than 6 months.

4. In the case of Metcalf, the Moss Landing expansion and Metcalf PG&E substation transformer bank, 500/230 kva appear to meet San Jose power and reliability needs in an environmentally better way for numerous years into the future.

Conclusion:

Intervenor declares under penalty of perjury that the submitted material is accurate and true to the best of his knowledge and belief.

June 30, 2000

*original signed by RFW*

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dated

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Robert F. Williams

Appendix 1  
High Profitability of CCGT Power Plant  
In the present and future energy market

I. Introduction

This material is germane to this proceeding because

- it indicates the financial resources available to the applicant to perform a first class engineering job, and to provide mitigation of human and environmental impacts that on first glance might appear to be a nuisance to the applicant.
- It indicates the large financial incentive the applicant has to delay and obfuscate on responses to conditions of compliance once the plant is operating.
- It raises the question of the adequacy of the present structure of the Commissions fines, and violation correction process. Based on workshops the largest fine by the CEC has been about \$ 75,000

II. Analysis

1. Assume the price Cal-Iso pays will 'only' be 3 cents per KWhr. Daily revenue will thus be \$432,000 per day. (600,000 KWhr x 24 hr/day x \$.03 per KWhr.)
2. Assuming for the moment leveraged financing like the regulated utility, \$ 40 Million of Owners equity will be returned in about 100 days. The borrowed money for the \$400 Million total capital cost (\$360 M) will be returned in about two years. Owners will have spent \$ 40M plus one year interest, since the average borrowing will be one half the total borrowing assuming uniform payments.
3. Prices higher than \$.03 per KWhr are being paid by Cal Iso routinely on hot days in the summer. Consumers prices are 3 times higher.. Generation is about 4 to 5 cents per KWhr but transmission distribution and special charges raise the rate to 12 or 13 cents per kwhr at the meter..
4. With daily revenue of \$432,000 per day, and some peak days at 10 cents KWhr, or \$1.44 Million per day, the return is so great it hardly pays to do the compound interest calculation, and confuse people.
5. Costs. There will be a few costs that cut into the pure profit, the cost of fuel the biggest, But since Calpine is vertically integrated with major natural gas holdings, they will basically pump natural gas from their own reserves, much of it from small wells in the delta. Most of the "cost" for fuel will be the tax shelters like the depreciation of the equipment and the depletion allowance that big oil has succeeded in getting from the Congress. i.e. they will not be cash outlays. They will tax shelter the income. There may be tax credits to methane users as recently proposed by candidate Gore.

Staff annual cost, perhaps 20 people at \$100 K/yr = \$ 2 Million.

Reagents and chemicals Guess less than \$ 1 Million per year.

Maintenance and refurbishment. Annual outage Guess \$10 Million, for catalyst and for Gas turbine refurbishment. This amounts to about \$30,000 per day, compared to revenue of \$400,000 to \$ 1.4 Million.

6. Fuel prices. Likely to run between \$ 2 and \$ 5 per MBTU. Cost basis for gas in the well most likely under \$ 1 per MBTU. Profits will shift between gas and electric subsidiary.



Appendix 2  
Intervenors Submittal to Air Quality Workshop April 5, 2000

1. Protection of Local Air Quality.

The CEC and Calpine lack power of eminent domain, to take private land and overturn local zoning. Remember that Calpine-Bechtel Enterprises are private for profit companies, and they seek to change to the local zoning that for about 20 years has been residential and campus industrial.

- Despite misleading advertising by Calpine, the need for power is by law, not even an issue under utility deregulation. (Bay Area growth in power demand can and is being met by regional plants, at Moss Landing, 30 miles to the South and near Pittsburgh, 30 miles east of Oakland, built in locations with heavy industrial zoning.) Thus there can be no showing of public necessity and convenience, for Metcalf, and the California Energy Commission does not have the authority to override local zoning in this case.
- Grid reliability cannot be used as the excuse for exercise of power of eminent domain by the California PUC, still the regulator of PG&E power transmission. New transformers already planned for installation by PG&E at the Metcalf transmission substation at a cost of about \$20 Million, meet the need for grid reliability.
- Because Calpine is private for profit company, it has no power of eminent domain, and no inherent right to this site, or this zoning change, even if they manage to buy from the local property owners.
- The San Jose City Council, because of air quality impacts, and the duty to protect the quality of life in the City, have the duty to maintain the present campus industrial and residential zoning, which local residents have relied on for 20 years.

2. Cumulative Air Quality impacts demand we choose Cisco over Calpine.

Based on material in the Cisco EIR, and in the MEC application for certification, Calpine should not be wasting our time here today. The data shows there is barely adequate margin for development of the Campus Industrial site, and the related residential development. There is not adequate air quality margin for both. Cisco is a conforming use, and Calpine is a heavy industrial use that requires a variance, and a zoning change. If Calpine were the good corporate neighbor they claim to be, they would gracefully withdraw from the Metcalf site.

- Calpine's actions speak louder than words. If they gave a damn about the neighbors, they would not propose wet cooling, but instead would propose somewhat more benign dry cooling. The so-called beneficial use of tertiary treated sewage is specious. There are better ways to protect the Bay than to evaporate 4 million gallons per day of water into an office park and residential area.
- Power plants at Moss Landing and Pittsburgh, are very close from an electric grid point of view, and are at existing industrial sites. These sites, plus hydro power from the Northwest and the Sierras easily transmitted on the Western grid, can and should continue to be the source of electrical generation for Silicon Valley. Such sites won't pollute the homes and office buildings of the people on whom the prosperity of Silicon Valley ultimately depends.

3. Summary of Disqualifying Air Quality Issues. There are four major topics in air quality, each sufficient to disqualify the Tulare Hill site for present or future development as a power plant. Each major topic has several inter related sub-issues, that when taken together, demand that the power plant not be located at Tulare Hill. These issues are listed here, and underlying technical bases are discussed below.

- Air Quality modeling is not adequate for a site with Metcalf's special features. Present air quality models are not suitable due to stack height, nearness of adjacent hill, presence of saturated atmospheric marine inversion layers, lack of site specific data, and other factors.
- Cumulative impacts of Cisco and the power plant are unacceptable.
- There are better alternate sites- Fair interpretation of CEQA demands the no plant option or location at one of the alternative sites near Brokaw and Zanker roads in northern San Jose.
- Impacts of wet cooling towers are in and of themselves disqualifying. There will be a massive thermal plume, a cloud of steam visible a significant number of days.

4. Air Quality Modeling. — There are numerous gaps significant both to Stack Gas and to Cooling Tower Analysis

a). Stack height, Tulare Hill Height, Office Park building height too close. Despite numerous false starts in previous submittals, e.g. louvers on the combustion gas stacks, and changes to the plant footprint, the present design is inadequate because the height of the combustion gas stack, roughly 150 ft, is too close to the height of the power plant buildings, and to the height of the office park buildings, nominally 120 ft. In addition, the wake effect from Tulare Hill demands a more elevated release of both combustion gases and cooling tower effluents. Good engineering practice would normally result in taller stacks. The applicant has used the a very minimal height to try gain approval for a zoning variance in an office park.

b) Lack of any data on site specific meteorology-Despite requests for Site specific data that were made almost one year ago, the applicant apparently cares so little for the health of the neighbors that there is still no on site meteorological data. Data is required on three major categories of air quality, (1) the concentrations of pollutants, now extrapolated from 12 miles away, (2) data on wind direction and careful measurement of duration of periods of calm air, (3) and the height and saturation of marine temperature inversion layers that frequently overlay the site. The validation of air quality models, even though performed by my former employer, EPRI, does not appear applicable for releases so close to buildings and terrain at this site, and considering the effects of the marine inversion layer.

c) Effect of condensable gases on the modeling. The effects of condensation in the plume of the offgas stack, and in the cooling tower effluents do not appear to be adequately considered in the benchmarking of the models.

d) Effect of marine inversion layer, with air near saturation. The effect of the marine inversion layer does not appear to have been adequately considered in benchmarking the air quality models or in computing the environmental effects of stack gas and plume condensation. The marine layer may have two undesirable effects, not properly considered in the modeling. (1) The layer may act as wet blanket trapping pollutants and stack gases, and preventing the rise of the plume, leading to channel flow under the marine layer. (2) The marine layer may greatly increase condensation of both moisture from combustion, and moisture from cooling towers. Representations that there will be visible plumes

of steam only 20 days per year are not credible or believable, because they don't account for the temperature inversion and nearly saturated marine layers. We know from pictures from other power plants that plume and stack condensation will be bad, we just don't know how bad. The data presented are not convincing since there is no real data on plume condensation and fallout for input to the calculations.

e) Present cooling tower arrangement on the site will aggravate cooling tower condensation and ground deposition of solids from the cooling tower effluent, and will encourage stack gas and cooling tower plume interaction and condensation. A bigger site with more separation between combustion gases and cooling towers is required, particularly with such a short combustion gas stack.

The major axis of the cooling tower appears to be essentially the same as the direction of the prevailing wind. This means that the cooling plumes from the upwind towers will interact with the downwind towers increasing the amount of water that will condense at or near the site, and potentially increasing the amount of dissolved solids that will drift from the cooling towers to adjacent property.

Air entering downwind towers may already be partly or completely saturated from the effect of upwind towers, rendering the performance of downwind towers unreliable and difficult to predict.

There is a potential for more PM10 to be discharged from the cooling towers than is discharged from of combustion gas stack, because the towers will operate with relatively high levels of dissolved solids.

f. Fallout zone. Eddy effects of the Tulare Hill can be expected to cause a swirling effect that will cause the combustion gas and cooling tower effluent to interact, increasing local condensation and deposition of combustion gas, and more widespread dispersal of cooling tower particulate. The cooler cooling tower effluent will interact and condense the hotter stack gas, dropping it below saturation and causing significant condensation and deposition. In the presence of a marine layer cap, the fallout could be much worse.

#### Fallout zone Illustration.

A moving fallout zone, an ellipse, is likely to occur, to the South when wind is from the North, and to the North, when wind movement is from south to north, on days when an inversion or marine layer is present. An ellipse 1000 feet long by 200 feet wide has an approximate area of 200,000 square feet.

Combustion gas water: about 700,000 gallons per day, (about 6 million lbs. per day)

Cooling tower water: about 4 Million Gallons per day, (33.2 million lbs. per day)

If only 1 percent of the discharge water condenses in a 1000 ft interval over a 6 hour period, the daily fallout could be 1/2 lbs. of water per square foot, or about 3/4 inches of rainfall per week. The modeling is not accurate enough to assure that significant pockets of high water deposition will not occur. The fallout zone will move with wind direction change, and atmospheric conditions.

g. Transient performance of the plant not sufficiently considered. It does not appear that there is sufficient data, or sufficient plant control and instrumentation, to assure that air quality performance will be maintained during startup and shutdown, and during part load operation.

- For example, the catalytic converter on the power plant is a major scale up in size. No one can be sure that it will work as projected in a unit that is many times the size of the previous prototype. Balancing ammonia, air flow, and fuel flow will be a significant challenge, particularly during startup and shutdown.



- To secure high thermal efficiency, high combustion temperatures are required that result in temperatures near structural limits for the turbine. On some occasions the rotor in the gas turbine will be near thermal damage limits. To avoid damage to the turbine, it may be necessary to have transient violations of air quality, at the expense of the local residents and office workers particularly if there are load rejection incidents, or transients caused by loss of feedwater or condensate pumps.

5. The cumulative effects of Cisco and the power plant are unacceptable. Cisco's impacts are largely due to automobiles, which are a distributed source spread out geographically, and at predictable peak traffic times. Calpine is a concentrated point source, that may continuously discharge pollutants.

- Automobile catalytic converters are inspected yearly, and new automobiles with better emission control are constantly introduced.
- What is built by Calpine may never be upgraded. It may not even work as well as promised because the SCR which uses ammo is being phased out, and SCONOX technology has only been used on small plants. The conversion of ammonia to secondary PM10 significantly reduces the SCR benefit. Yet there is no guarantee that retrofit to a better technology will occur.

The application for certification is not complete until the cumulative effects of Cisco and the power plant are computed. Because Calpine is the non conforming use, it appears logical and just that Calpine compute the cumulative air quality impacts in the Metcalf EIS. The data for the contribution from Cisco is available in public documents, or could be constructed by Calpine using calculations by its consultants.

The METCALF application for certification is NOT data adequate, or suitable as an EIR for San Jose rezoning, until the cumulative effects of MEC and Cisco have been calculated. A Preliminary Staff Assessment, and evidentiary hearings should NOT be allowed to begin on the Tulare Hill Project until the cumulative air pollution effects have been presented by the applicant, checked and incorporated by CEC in the Preliminary Staff Assessment.

6. Unnecessary Risks. Model benchmarking suitable for a City Location is lacking

- Correlative versus mechanistic models. The equations of heat, mass, and momentum conservation should be used for analysis of three dimensional flow with a condensing gas. Condensation of moisture in stack gas and in cooling tower plume is virtually certain at this site on typical foggy days, with a marine inversion layer near saturation with respect to moisture. The present BAAQMD models, ISC-Prime, and ISCST3, might be adequate for rural areas or for location of power plants in industrial parks. The models do not appear adequate for this site without more benchmarking.

- The parameters elected by the plant owners are at the edge, or beyond the level of conditions appropriately benchmarked for the model. They apparently have done this purposefully, believing that as long as they barely meet limits everything is ok. Besides they appear to expect to use paper offsets, so called pollution credits to mitigate the effect. They recognize this is not real mitigation, only paper mitigation that has the effect of transferring pollution from the area where the old plant operated to the local area. Since the mitigation is not real, they apparently believe it is not necessary to calculate the real amount of pollution either.

- They fail to recognize that because of the lack of local data on true level of air quality, and because of lack of data on the depth and persistence of the Marine layer, the models may misrepresent local air quality impacts and be no conservative for several miles in whatever is the down wind direction.

It is not necessary to take these modeling risks in a City, when alternate rural sites and sites zoned for industrial use are available elsewhere. Historic practice has been to transmit electric power and save air quality for the people in the cities, by excluding stationary sources of pollution such as power plants.

Cooling Tower plume from a Large Power Plant  
On a Cold Day-No Inversion Layer

Picture deleted to save file space and assist file conversion 7/3/2000

## Appendix 3

### Submittals by various reputable parties on Air Quality Best Available Control Technology and Related Issues

Reference: (1) Californians for Renewable Energy Submittal to the BAAQMD on May 31, 2000, Submittal to CEC on June 14, 2000  
(2) CVRP submittal to BAAQMD on PDOC, May 31, 2000  
(3) Submittal of CURE in the Elk Hills proceeding 99-AFC-1 May 15, 2000

1. Submittal and Adoption. This intervenor, having reviewed the reference material, (1) the submittal of Californians for Renewable Energy, (2) the submittals by CVRP on the Metcalf PDOC, and the (3) CURE submittal on the Elk Hills FSA, adopts this material by reference as part of his submittal and representations in this proceeding.

A few pages of the CURE petition are included for reference. The full petitions (1) and (2) have been served on all the parties to the Metcalf AFC, and docketed June 14, 2000. The CURE petition was reviewed in the evidentiary Hearings on Elk Hills, 99-AFC-1 on May 15, 2000 and is included in that docket.

2. Among the conclusions to be drawn from these reports are the following

- A top down analysis of Best Available Control Technology should be performed
- Secondary PM10 should be included in the analysis of SCR systems
- The requirements under the Clean Air Act for at site multi level meteorological monitoring should be honored, and such measurements taken forth with for a period of one year.
- A joint hearing by the CEC and the BAAQMD should be held to determine a new BACT for this project.
- A joint hearing of the CEC and the BAAQMD should be held to address cumulative impacts. Intervenor believes the development of North Coyote Valley as a world class Office Park, with urban areas in close proximity is reasonably foreseeable, and that the analysis by BAAQMD should include this impact. The need to apply cumulative analysis in some manner separate from the PDOC is a matter that is great inconvenience to all parties and runs the risk of leaving gaps and inconsistencies. The joint hearing can be avoided if BAAQMD addresses the cumulative impacts, using ground rules that include the reasonably foreseeable growth over the next decade.
- The effects of wet cooling towers, both drift and plume deposition must be considered using accurately determined meteorological conditions.
- The cumulative effect of water generated by combustion, approximately 4 Million tons per year must be evaluated for potential increases in humidity, and for deposition under conditions that lead to frost in colder regions of the area.
- Carbon dioxide must be considered in the Metcalf proceeding in some way. Bases and alternatives are as outlined in Appendix 4.

## Appendix 4 Discharge of Carbon Dioxide and Methane

### I. Relevance

The discharge of carbon dioxide is relevant to this proceeding for the following reasons:

- The CEC and the review process in aggregate under CEQA must address all environmental effects, especially potentially adverse effects.
- While the issue of global warming due to carbon dioxide discharge, and unburned methane leakage and accumulation in the atmosphere is a matter of scientific controversy, the matter deserves to be heard, and a finding made as part of the licensing action on a large power plant.
- The matter cannot or should not be left to others when the discharge of carbon dioxide by a 600,000 kilowatt electric plant is so massive, approximately 2 Million Tons per year. If the carbon dioxide were a liquid or a solid, it would require each day 60 rail road cars hauling 100 tons each, to carry the 6000 tons per day of carbon dioxide to a disposal site.
- If somehow the carbon dioxide were solidified, for example as calcium carbonate, the viability of dumping 6000 tons per day of solids, 60-100 ton rail cars per day, would be a matter that would at least be reviewed, and I suspect regulated.
- Massive amounts of methane are required in the energy infrastructure, and small amounts of leakage from well, to pipeline, to power plant to gas turbine must be inspected and controlled.

On a mole basis, one mole of methane (a term in chemistry referring to a molecule) produces one mole of carbon dioxide, heat, and two moles of water when burned in air. In layman s terminology, the atmospheric window for methane is not yet closed to the same degree that it is closed for carbon dioxide. Stated differently, one molecule of methane may do as much damage to the atmosphere in terms of trapping radiation, as 15 or 20 molecules of carbon dioxide. This is due to the carbon dioxide being sufficiently great in concentration to saturate its effect in terms of greenhouse warming, while methane has not as yet reached saturation.

- Both the fuel methane and the discharge waste, carbon dioxide are relevant to this proceeding.

Conclusion: The largest streams of pollution from the plant, the leakage of fuel gas, and the discharge of carbon dioxide in the amount of approximately 2 Million tons per year must be addressed and evaluated in someway.

This proceeding cannot or should not ignore the largest net effluent from the plant, 6000 tons per day of carbon dioxide. To remain silent fails every test of reasonableness and common sense. (Engineers call it a sanity check, lawyers call it reasonableness or under principles of common law, equity.)

## II. Status of carbon dioxide control technology

### A. Background

1. It is not the duty of the intervenor to develop pollution control technology, nor to assist the applicant in the design or the development of the plant. To make the case for consideration, it should be sufficient to show that there is a probably hazard, and to show that there are some technologies sufficiently advanced to be considered for use in mitigation.

If there is no technology for mitigation, and the hazard is sufficiently great, then the plant should not be built, and alternate non emitting sources found for the power, for example solar electric, wind turbines, or nuclear energy.

2. It is also relevant to note that international treaties have been drafted setting targets for reduction of emissions to 1995 levels. Treaties are in theory the highest law of the land, but the status of treaties on carbon dioxide reduction are not known to this party at this time. It stands to reason that if the treaty were in effect the regulators and the applicant would be doing something.

3. Abatement at a power plant, a stationary source, is much more logical than abatement in different locations, if direct immobilization or diversion to the ocean technology is to be used, because of the much higher concentration, hence lower gas volumes to process, than after release and dilution in the atmosphere. Thus the technology should be considered as part of individual plant applications.

### B. Status of technology for mitigation or abatement of unburned methane release.

1. With respect to methane, very careful inspection and monitoring of the methane supply structure, beginning at both natural gas wells, and oil wells where methane is a co product is required. In simple terms this requires inspections for leaks, changes to key technology component that are prone to leaks, and enforcement so that sloppy operating practices do not result in leaks. More does not need to be said at this juncture. Attainment goals for the energy infrastructure, from well head to end use, could and should be established, similar to the requirements for smog devices on cars.

California has set precedents before in the case of automobile pollution, and could do so again.

### B. Status of technology for mitigation or abatement of carbon dioxide release to air.

1. Ultimate sequestration in atmosphere. With respect to carbon dioxide, the issue is a bit more complex.

- Carbon dioxide discharge to the atmosphere, a gaseous ocean, serves as nutrients for green plants. The process of photosynthesis converts the CO<sub>2</sub> to carbonaceous compounds, sugars, and cellulose, (generically trees and biomass) and releases oxygen.
- Carbonaceous material where it serves as food for animals, which by definition do not conduct photosynthesis.
- Carbonaceous material such as trees and biomass may be sequestered from the environment by deposition in land or under mud and sediments in the ocean. Under anoxic conditions, carbonaceous material can be preserved indefinitely, for 10 s, 100 s or millions of

years, where deeper and deeper burial converts the material to coal, oil or natural gas. Trapped below impermeable sediments.

Thus one obvious strategy is to plant trees in proportion to the amount of fuel burned. A ball park estimate is that each tree depending on species may sequester 200 to 1000 lbs. of carbon dioxide per year. (Preliminary estimate of author)

2. A limited number of power companies have adopted the strategy of tree planting, or alternatively, using funds to assure preservation of the rain forest in Brazil around the Amazon River or elsewhere. The rainforest may be far more efficient than temperate latitudes, and thus more cost effective. I am told, and can confirm with future written inquiries that one power company in New York State is conducting such a program

3. Oil refineries routinely recover carbon dioxide for use in the petroleum refining process. Such techniques may be more expensive than economically feasible because of the very large amounts of carbon dioxide generated by burning natural gas. (More later)

4. Summary. Mitigation by planting trees or preserving or adding to the tropical rain forest appears feasible and proven. It is not clear that total abatement is achieved, but substantial abatement may be all that is required.

C. Status of technology for diversion or abatement of carbon dioxide release, by diversion to ocean and ocean disposal.

1. A second ultimate sink for carbon dioxide is the conversion carbonates, for example to limestone that occurs in the ocean. There are two fundamental ways to take advantage of the apparent much greater capacity of the ocean to sequester carbon dioxide.

- Carbon dioxide is a food for plants, beginning with phyto plankton at the bottom of the of chain, and moving upward until animals that form skeletons of carbonates with calcium ingest the phyto plankton, and other more complex plants and animals.

Shells and skeletons of calcium carbonate have formed and are now forming massive limestone deposits. These deposits occur in the land mass of continents and on the ocean floor. Some limestone deposited on the ocean floor, will under the forces of continental drift enter ocean subduction zones, and the carbon will be released as the plate is suducted.

2. Man induced or enhanced diversion to the ocean. Because the atmosphere appears to be reaching its capacity for carbon dioxide, but the ocean has apparently a substantially greater capacity, two strategies are obvious to clean the atmosphere, by diversion to the ocean.

- Catch and pump carbon dioxide in salt water into the ocean, and let the carbon dioxide serve as food for plants at the bottom of the food chain.

- Catch and precipitate the carbon dioxide as soluble or insoluble carbonates, and deposit the carbonaceous material in the ocean.

Because of the massive amounts of material that must be processed each day, 6000 tons per day, or 60—100 ton rail cars, a simple system that uses ocean water, and fluid handling of solidified material to the maximum extent is highly to be desired for economic reasons.

3. This party has not yet had time to complete a literature survey, in part because the literature is so voluminous, and numerous options are in various stages of development.

These matters can be discussed at a later date, in parallel with BACT hearings on criteria pollutants.

### III. A Feasible Regulatory Framework-given today's and near term technology.

An abatement requirement, together with direct emission control requirements and an optional abatement fee, will provide the necessary incentives to commercialize technology, while mitigating methane and carbon dioxide pollution.

1. It appears some agency of government can or should have the duty to regulate the uncontrolled discharge of carbon dioxide and methane. Since the quantities are so great.

2. A strategy developed by this party for carbon dioxide, and possibly one with precedent in regulation of other technology, is as follows;

- Establish an abatement cost, to be levied by the CEC or other agency as regulator. Allow the applicant two options, to abate the problem directly with his own equipment to specified control limits, or pay the abatement fee in lieu of constructing the equipment, planting the trees, or building the scrubber or designing and operating the atmosphere to ocean diverter.
- Ideally the abatement fee could be set somewhat higher than the cost of best available control technology, so that there is an incentive for the applicant to privatize, thus avoiding the inefficiencies of tax collection, big government, and big bureaucracy.

#### Illustration

- For purposes of illustration an abatement fee of about \_ cent per Kwhr net electric appears to be in the ballpark, for cost, but that of course would be confirmed by more complete hearings and presentations.

For purpose of illustration, based on experience with costs of processing and handling other materials in large quantities, a cost of \$10 per ton of carbon dioxide taken from the plant and moved to the ocean depth where it is not available for immediate release is credible. This amounts to \$20 Million per year to scrub and transport 2 Million tons per year,  $\$20 \text{ M}/\$2\text{M} = \$10 \text{ per ton}$ .

The abatement fee if then set somewhat higher at \$40 Million per year for the 600 Mwe plant, provides a potential competitive advantage for the entrepreneur to build the system at lower cost, and gain a slight competitive advantage over those who choose to pay the abatement fee. Basing the fee on electric



output rewards the entrepreneur with the more efficient plant that produces less carbon dioxide. He has less waste to process, thus presumably more cheaply.

This provides a ready mechanism to deal with older plants, if the abatement fee is applied to them. A centralized entity can deal with tree planting, or rain forest protection. It also provides a way to direct some of the large profits from operation of highly profitable gas turbine power plants, (See Appendix 1), directly to a public good, carbon dioxide and methane abatement. The abatement tax assures some of the excess profits of CCGT plants are used for pollution control and levels the playing field between solar, wind and nuclear options that do not emit carbon dioxide. This is arguably a simpler approach than other tax shelter or tax incentive plans, or tax credit plans.

Conclusion: CARB and CEC should hold a public hearing, and then a rulemaking to set limits and propose fees in lieu of mitigation for carbon dioxide and methane.

Appendix 5  
Chapter by Chapter Comments.

I. Introduction

This party attended 6 full days of meetings on the PSA June 13-15, and June 20-22, 2000 in San Jose, and submitted numerous verbal comments. This party has worked days, nights and weekends to prepare this submittal.

Regrettably, the press of other matters has prevented a complete list of applicants verbal comments from being typed. Appendix 5 material will be submitted as a supplement to this submittal as soon as notes can be completed, and in any event not later than July 10.

In view of numerous outstanding data requests, and the complexity of other issues raised, Intervenor believes the submittal of this appendix will be timely and should be allowed.

Chapter by Chapter detailed comments.

(Later) by July 10, 2000